REMARKS

Applicant respectfully requests reconsideration. Claims 1-7, 9, 11-25 and 27-31 were previously pending in this application. Claims 1, 3-7, 9, 11-13 and 16 have been amended. New claims 32-52 have been added. As a result, claims 1-7, 9, 11-25 and 27-52 are pending for examination. Claims 27-31 are withdrawn from consideration.

- Claim 1 has been amended to refer to an "effective amount" of the TiO_2, which amount is "sufficient to impart" to the composition the specified rate of loss of UV absorption in claim 1. The specification discloses, for example in the last passage on page 2 and in the first passage of page 3, that the degradation of an organic component and the resulting rate of loss of UV absorption is due to the incorporation of doped TiO_2 in the composition. Clearly, the amount of the doped TiO_2 present in the composition must be an effective amount that is sufficient to provide the rate of loss of UV absorption specified in claim 1 (see the last sentence in the first passage on page 3). The amendments to claim 1 to specify an "effective amount" and for the amount to be "sufficient to impart..." are therefore supported by the application as filed.
- The term "other element" in claim 1 and the term "dopant" in claims 4 to 7 have been amended to "dopant element". Basis for the amendment is provided in the specification, for example, in the first paragraph of page 6. It is also clear from previous dependent claims 4 to 7 that the term "dopant" was intended to refer to the "other elements" in claim 1.
- The reference to "reduced" has been deleted from claim 3.
- The specific dopant "vanadium" has been deleted from claim 4.
- Claims 6 and 7 have been amended to clarify that the amount of dopant element is present in the doped TiO_2.
- Minor clarifying amendments have been made to claims 9 and 11 for consistency with the amendments made to claim 1.
- Claims 12 and 13 have been amended to refer to a "primary" particle size. Support for the amendment is provided, for example, on page 7, line 17 of the specification.

- The spelling of the "dibenzoylmethane" organic sunscreen agent in claim 16 has been amended for conformity with that given on page 9 line 20.
- New claims 32 and 47 are supported in the specification, for example on page 10, line 19 and include a range of "0.1% to 5% by weight" for the amount of organic sunscreen agent.
- New claim 33 is supported in the specification, for example on page 7, lines 26 to 27.
- Claim 34 is a new independent claim based on claims 1 and 3, where the dopant elements have been restricted to manganese, chromium and vanadium. The recited organic component is an organic UVA or UVB sunscreen ingredient. Additional support for this claim is provided in the specification, for example on page 4, lines 10 to 14.
- New dependent claims 35 to 52 recite subject matter from dependent claims 2 to 33 above.

No new matter has been added.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 1-7, 9 and 11-25 under 35 U.S.C. §103(a) as being unpatentable over Knowland et al. (WO 99/60994) in view of Mitchnick et al. Applicant respectfully requests reconsideration.

The Examiner correctly points out that Knowland et al does not exemplify a formulation comprising doped titanium dioxide and a UVA, UVB or broadband sunscreen agent, nor does it disclose examples of specific UVA, UVB or broadband sunscreen agents.

To rectify these deficiencies, the Examiner has combined Knowland et al with Mitchnick et al. On page 4 of the Official Action, the Examiner has incorrectly stated that the feature of the claimed composition "*has a rate of loss of UV absorption of at least 5% less than that of a composition having the same formulation except that it does not contain the said…zinc oxide which has been doped with another element or the said reduced zinc oxide*". There is no mention of zinc oxide in claim 1 of the present application.

Claims 1 and 34

Independent claims 1 and 34 as amended recite that the composition must comprise an effective amount of TiO_2 which is doped, which amount is sufficient to impart to the composition a rate of loss of UV absorption that is at least 5% less than that of a composition having the same formulation except that it does not contain the said TiO_2 which is doped. Thus, the claimed composition must possess a certain effective amount of the doped TiO_2 in order for it to possess the specified rate of loss of UV absorption. This amount may be determined using a method such as that described on page 5, lines 4 to 11 and Example 1 of the present application. As will be understood from the explanation below, the combination of Mitchnick et al and Knowland et al does not teach that an effective amount of doped TiO_2 must be included in a composition to provide the specified reduction in the rate of loss of UV absorption set out in claim 1 of the present application.

Mitchnick et al requires the presence of rod-shaped particles of ZnO. According to column 1 lines 63 to 68 of Mitchnick et al:

> *"Zinc oxide particles of the invention, because they are rod-shaped, may assume a side-by-side arrangement or a criss-cross-packing arrangement, once the surface is coated with the composition, such that there are relatively few gaps between the particles for UV rays to penetrate."*

Thus, Mitchnick et al teaches the use of a physical zinc oxide barrier coating to provide protection against UV light. The purpose of adding the conventional organic sunscreen, octyl methoxycinnamate, appears to be merely to protect the skin against UV rays that pass through the "relatively few gaps between the particles".

It is notable that a high amount (7.5% according to the Table at the top of column 12) of octyl methoxycinnamate is used in Mitchnick et al. This amount is sufficient to afford sunscreen protection for a day. A high amount of octyl methoxycinnamate is included in the composition to compensate for any degradation of the organic sunscreen agent that will occur on exposure to sunlight during the day. Thus, Mitchnick et al is not concerned about the decomposition of octyl

methoxycinnamate upon exposure to UV light, nor the rate of decomposition of that material. Mitchnick et al simply does not recognize the problem which the present invention overcomes, namely the decomposition of an organic component, such as an organic sunscreen agent, due to the action of free radicals that are generated upon exposure of a sunscreen formulation to sunlight. The free radicals are generated, for example, by the action of UV light on non-doped TiO_2 particles.

Knowland et al also does not recognize the problem of degradation of an organic component by free radicals that are generated on exposure of a sunscreen formulation containing non-doped TiO_2. In Knowland et al, the doped TiO_2 is included to improve the UV absorption characteristics of the composition to protect the substrate to which it is to be applied.

Neither Knowland et al nor Mitchnick et al teach that the compositions must include an effective amount of doped TiO_2 that is sufficient to impart to the composition a rate of loss of UV absorption that is at least 5% less than that of a composition having the same formulation except that it does not contain the said TiO_2 which is doped. The claimed invention is not obvious from Knowland et al and/or Mitchnick et al when their teachings are considered individually or in combination.

Claims 32 and 47

The invention is based on the unexpected finding that doped TiO_2 is able to mitigate or prevent degradation to an organic component, such as an organic sunscreen, in a UV sunscreening composition. One of the advantages of compositions of the invention is that the same UV screening effect can be obtained over a given period of time in a composition containing a smaller quantity of a sensitive ingredient, such as organic sunscreen agent, compared to a composition containing only non-doped TiO_2.

Knowland et al and Mitchnick et al do not recognize, teach or suggest that doped TiO_2 is able to reduce or prevent the degradation of a sensitive organic component in a sunscreen composition, such as sunscreen agents, which may occur on exposure to UV light.

Knowland et al is silent about the amount of organic sunscreen agent that may be included in the compositions described therein. Mitchnick et al, on the other hand, discloses a composition comprising 7.5% by weight octyl methoxycinnamate (see the Table at the top of column 12). As explained above, relatively large amounts of an organic sunscreen component, such as 7.5% by weight, are generally included in a sunscreen composition to compensate for the degradation that occurs on exposure to UV light.

If a person skilled in the art were to consider the teaching of Knowland et al and Mitchnick et al, then he or she would not formulate a UV sunscreening composition containing both doped TiO_2 and a relatively low amount of organic sunscreen agent. He or she would certainly not include in a UV sunscreening composition an amount of organic sunscreen agent as low as from 0.1% to 5% by weight (as set out in claims 32 and 47 filed herewith) in the composition. Clearly, a person skilled in the art would expect such compositions to have poor UV screening characteristics because they do not contain a sufficient amount of the organic sunscreen component. The subject matter of claims 32 and 47 is unexpected and thus not obvious from Mitchnick et al and/or Knowland et al.

Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 1-7, 9 and 11-25 under 35 U.S.C. §103(a) as obvious.

Double Patenting Rejections

1. The Examiner provisionally rejected claims 1-7 and 11-25 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-29 of copending Application No. 10/563,062.

The invention claimed in the present application is patentably distinct from copending application No. 10/563,062, for the same reasons provided above in respect of Knowland et al and Mitchnick et al.

In the event that the Examiner does not withdraw this rejection, Applicant respectfully requests that the Examiner defer the double patenting objection until claims are allowable in this application, or in the co-pending application.

2. The Examiner provisionally rejected claims 1-7 and 11-25 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 8, 10-12, 16-20, 24-29, 50-52, and 54-55 of copending Application No. 10/588,071.

The invention claimed in the present application is patentably distinct from copending application No. 10/588,071, for the same reasons provided above in respect of Knowland et al and Mitchnick et al.

In the event that the Examiner does not withdraw this rejection, Applicant respectfully requests that the Examiner defer the double patenting objection until claims are allowable in this application, or in the co-pending application.

3. The Examiner provisionally rejected claims 1-7, 9 and 11-25 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 and 14 of copending Application No. 10/555,570.

The invention claimed in the present application is patentably distinct from copending application No. 10/555,570, for the same reasons provided above in respect of Knowland et al and Mitchnick et al.

In the event that the Examiner does not withdraw this rejection, Applicant respectfully requests that the Examiner defer the double patenting objection until claims are allowable in this application, or in the co-pending application.

4. The Examiner provisionally rejected claims 1-7, 9 and 11-25 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14, 16-17 and 20-21 of copending Application Nos. 11/054,188 and 11/207,408 in view of Knowland et al.

The invention claimed in the present application is patentably distinct from copending application No. 11/054,188 and 11/207,408, for the same reasons provided above in respect of Knowland et al and Mitchnick et al.

In the event that the Examiner does not withdraw this rejection, Applicant respectfully requests that the Examiner defer the double patenting objection until claims are allowable in this application, or in the co-pending application.

5. The Examiner rejected claims 1-7, 9 and 11-25 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, 7-8 and 10 of U.S. Patent No. 6,869,569 in view of Knowland et al.

The invention claimed in the present application is patentably distinct from US patent No. 6,869,596 in view of Knowland et al., for the same reasons provided above in respect of Knowland et al and Mitchnick et al.

In the event that the Examiner does not withdraw this rejection, Applicant respectfully requests that the Examiner defer the double patenting objection until claims are allowable in this application.

Accordingly, Applicant respectfully requests withdrawal of the rejections of the claims for obviousness-type double patenting.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, the Director is hereby authorized to charge any deficiency or credit any overpayment in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 23/2825, under Docket No. K0181.70019US00.

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Respectfully submitted,

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